UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/491,146	01/25/2000	Yury E. Khudyakov	03063-0381	8145

23370 7590 04/04/2002

JOHN S. PRATT, ESQ
KILPATRICK STOCKTON, LLP
1100 PEACHTREE STREET
SUITE 2800
ATLANTA, GA 30309

EXAMINER	
BRUMBACK, BRENDA G	
ART UNIT	PAPER NUMBER
1642	

DATE MAILED: 04/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/491,146	KHUDYAKOV ET AL.	
	Examiner	Art Unit	
	Brenda G. Brumback	1642	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 January 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13 and 16-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13,17, and 18* is/are rejected.

7)☒ Claim(s) *17 and 19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This action is responsive to the amendment filed 01/14/2002. Claims 14 and 15 were canceled. Claims 13, 16, and 18 were amended. Claims 13 and 16-19 are pending and examined on the merits.

Priority

2. Applicant's amendment of the specification to add the reference to the prior application(s) to the first sentence of the specification is acknowledged.

Claim Rejections - 35 USC § 112

4. The outstanding rejections of claims 13-19 under 35 U.S.C. 112, first and second paragraphs, are withdrawn pursuant to applicant's cancellation of claims 14 and 15 and amendment of claims 13, 16, and 18.

Claim Rejections - 35 USC § 102

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The rejection of claims 13 and 14 under 35 U.S.C. 102(b) as being anticipated by Khudyakov et al., the rejection of claims 13 and 14 under 35 U.S.C. 102(b) as being anticipated by Fields et al, and the rejection of claims 13-16 under 35 U.S.C. 102(a) as being anticipated by Ruedinger et al. are all withdrawn subsequent to applicant's cancellation of claims 14 and 15 and amendment of claims 13, 16, and 18.

Claim Rejections - 35 USC § 103

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The rejection of claims 13, 16, and 18 under 35 U.S.C. 103(a) as being unpatentable over Khudyakov et al., in view of Zhang et al., Bukh et al., and Chien et al. is maintained. Applicant's arguments have been fully considered but they are not persuasive for the following reasons.

Applicant argues that Khudyakov et al. provides no motivation for its combination with the other cited references because Khudyakov et al. teaches an HEV mosaic and there is no suggestion that this teaching can or should be applied to generate analogous HCV mosaic proteins. Applicant further argues that the work of Chien et al. is cited in a way that teaches away from the making of an HCV mosaic protein, and that the problem of detecting different strains of HEV was not entirely solved by use or the mosaic protein.

Applicant's arguments, however, are not persuasive because the motivation to combine Khudyakov et al. with the other references is found in Khudyakov et al. as follows. Khudyakov et al. teach that strain specific variation in antigenic properties is well known for other viruses in addition to HEV (see page 7072, column 2, last partial paragraph, second sentence). Khudyakov et al. teach that the mosaic protein is an advantageous diagnostic reagent because it allows for testing for the different strains of the virus, while eliminating epitopes which contribute to nonspecific reactivity. Khudyakov et al. suggest applicability of such a mosaic protein to diagnosis of HCV by referring to Chien et al. (of record in the present rejection), who teach successful construction of a fusion protein of HCV made from three recombinant proteins. Khudyakov et al. further suggest the applicability of the mosaic protein approach for hepatitis viruses other than HEV by teaching successful construction of a mosaic protein for diagnosis of hepatitis B virus. Regarding the expectation of success for mosaic proteins as immunodiagnostics for additional hepatitis viruses, Khudyakov et al. conclude "Thus, it appears very likely that successful imitation of the immunologic properties of antigenic epitopes with short synthetic peptides often will allow proper modeling of antigenic epitopes within a mosaic protein" (see page 7073, the paragraph bridging columns 1 and 2).

Regarding applicant's assertion that the problem of detecting different strains of HEV was not entirely solved by Khudyakov et al., applicant is reminded that absolute predictability is not required, but rather a reasonable expectation of success. The references in combination teach such a reasonable

expectation of success because Zhang et al., Bukh et al., and Chien et al. provide detailed teachings regarding HCV epitopes and genotypes which would have facilitated construction of the mosaic HCV protein of the claimed invention.

Applicant's argument that none of Zhang et al., Bukh et al., and Chien et al. provides any motivation for its combination with the other cited references argues against each of the references individually, because the motivation to combine these references with Khudyakov et al. is found in Khudyakov et al., as was set forth *supra*. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant's comments regarding Zhang et al. and significant motivation not to generate a mosaic HCV protein are noted; however, once again applicant is arguing against the reference individually because Khudyakov et al. teaches that combining reactive epitopes from different genotypes of a virus into a single fusion protein allows for the recognition of multiple genotypes using a single polypeptide. Furthermore, the fact that Zhang et al. teach successful recognition of different genotypes of HCV using separate peptides does not teach away from combining these peptides into a single fusion protein, for simplicity.

Regarding Bukh et al, applicant argues that Bukh et al. teaches using different antigens that have sequences conserved across the different genotypes and provides motivation and guidance to use the information in a way that does not suggest the present invention. This is not persuasive because, as has been discussed previously, the motivation to combine antigens from different genotypes into a fusion protein is found in Khudyakov et al. Bukh et al. provides information regarding epitopes and sequences of the different genotypes of HCV which would have enabled construction of the fusion protein suggested by Khudyakov et al.

Applicant argues that Khudyakov et al. "specifically points to the approach taken by Chien et al. as a promising alternate approach to generate a better HEV diagnostic than the HEV mosaic ". However, a review of the paragraph in Khudyakov et al. bridging pages 7072-7073, where Chien et al. is

referenced, reveals that Khudyakov et al. is actually teaching that the Chien et al. approach to constructing a fusion protein which combines several different HCV antigens into a single fusion protein overcomes a known problem regarding reduced sensitivity to each of the individual proteins when several different proteins are adsorbed onto the same surface of a microtiter well. Khudyakov et al. teaches that the HEV mosaic protein retains the advantage of optimal sensitivity which is gained by combining antigens into a single fusion protein, as was taught in Chien et al. (see especially the last full sentence of page 7072).

New Grounds of Objection

Specification

7. The use of the trademark MATRIX has been noted in this application. It should be capitalized wherever it appears and **be accompanied by the generic terminology**.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Conclusion

7. Claim 17 and 19 are objected to as depending from a rejected claim. However, as was set forth in the previous Office action, amendment of claims 17 and 19 to be written in independent form, including all of the limitations of the base claims and any intervening claims would place these claims in condition for allowance.

8. Due to the new objection to the specification herein, this action is made nonfinal.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brenda Brumback whose telephone number is (703) 306-3220. If the examiner can not be reached, inquiries can be directed to Supervisory Patent Examiner Anthony Caputa whose telephone number is (703) 308-3995. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0196. Papers related

to this application may be submitted to Group 1600 by facsimile transmission. Papers should be faxed to Examiner Brenda Brumback, Art Unit 1642 and should be marked "OFFICIAL" for entry into prosecution history or "DRAFT" for consideration by the examiner without entry. The Official FAX telephone number is (703) 872-9306 and the After Final FAX telephone number is (703) 872-9307. FAX machines will be available to receive transmissions 24 hours a day. In compliance with 1096 OG 30, the filing date accorded to each OFFICIAL fax transmission will be determined by the FAX machine's stamped date found on the last page of the transmission, unless that date is a Saturday, Sunday or Federal Holiday with the District of Columbia, in which case the OFFICIAL date of receipt will be the next business day.

Brenda Brumback
Patent Examiner